

# **DIFFERENTIAL DENSE WAVELENGTH DIVISION MULTIPLEXING (DDWDM) IN OPTICAL SYSTEMS**

## **Abstract of Disclosure**

An apparatus provides an optical wavelength division multiplexed signal having 2M optical channels such that each of M information-bearing signals are differentially encoded onto 2 of the 2M optical channels. In particular, the apparatus comprises M inverters, 2M electrical-to-optical converters and a multiplexer. Each electrical-to-optical converter provides an optical signal at a different one of 2M wavelengths. The apparatus receives the M information-bearing signals and (a) creates M optical signals, each at a different wavelength, by converting each of the M information bearing signals into the optical domain via M of the 2M electrical-to-optical converters, and (b) creates M inverted optical signals, each at a different wavelength, by first inverting each of the M information bearing signals (via the M inverters) before conversion into the optical domain via the remaining M electrical-to-optical converters. The M optical signals along with the M inverted optical signals are then applied to the multiplexer, which provides an optical wavelength division multiplexed (WDM) signal having 2M channels.

Figures

Figure 1: A line graph showing the relationship between the number of hours spent studying and the score on a test. The x-axis represents 'Hours Studied' (0 to 10) and the y-axis represents 'Test Score' (0 to 100). The data points are as follows:

Hours Studied	Test Score
0	50
1	55
2	60
3	65
4	70
5	75
6	80
7	85
8	90
9	95
10	100

The graph shows a positive linear relationship, indicating that as the number of hours spent studying increases, the test score also increases proportionally.